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PROVISIONAL SPECIFICATION

FOR THE INVENTION ENTITLED:

"STRUCTURAL COMPONENT"

Applicant:

JOHN CLEMENT PRESTON

The invention is described in the following statement:

STRUCTURAL COMPONENT

Technical Field

This invention relates to a structural component adapted for use in the construction of temporary or semi-permanent structures, and, in particular to a demountable staging tower adapted to be positioned adjacent to a building under construction.

Background

There are a number of known structural components from which a demountable staging tower or other temporary or semi-permanent structure can be built. One such simple form of structural component is an "I" beam, which can have some holes drilled into it at each end so it can be attached to another "I" beam or other component. Such structural components are generally not suitable for use on a subsequent towers or other structures as its necessary length may not suit the particular job and as such the "I" beam has to be scrapped or reworked to suit a particular new structure.

There are known structural components which can be used for constructing temporary scaffolding structures and which upon dismantling, can be re-used for subsequent structures. There are known propping systems that utilise various modular vertical props (uprights) and horizontal and diagonal cross members. A disadvantage of such propping systems is that generally where a large temporary scaffolding or tower structure is to be constructed the uprights can only be used as uprights facing one direction and they cannot be rotated and used on all sides attached to another common part. Furthermore, the modular horizontal members of such propping systems generally cannot be used as uprights, as they are configured specifically for horizontal use in conjunction with the uprights.

The present invention seeks to alleviate the difficulties and disadvantages associated with known structural components.

Summary of Invention

In one aspect the present invention is an elongate structural component having at least four planar side faces extending along its length wherein each side

face has at least two rows of aligned apertures, the centre to centre distance between neighbouring apertures in each row being "d" and the centre to centre distance between corresponding apertures from one row to another is equal to "nd" where "n" is a whole number.

In a second aspect the present invention is an elongate structural component having four planar side faces disposed about a longitudinal axis and a sectional shape perpendicular to said longitudinal axis that is substantially rectangular, wherein each side face has at least two rows of apertures extending substantially parallel to said longitudinal axis, the centre to centre distance between neighbouring apertures in each row being "d" and the centre to centre distance between corresponding apertures from one row to another being "nd" where "n" is a whole number, and the distance between the centre of each aperture and an edge of its respective face in a direction orthogonal to said longitudinal axis being "m d/2" where "m" is a whole number.

Preferably said sectional shape of said component is square.

In a third aspect the present invention consists in a structural component adapted for use in the construction of temporary structures, said component comprising at least four elongate faces and four elongate edges disposed about a longitudinal axis, and two spaced apart end faces disposed at substantially right angles to said longitudinal axis, each edge disposed at the junction of two said elongate faces, each elongate face having at least two aligned spaced apart rows of apertures each of which is located near and parallel to a respective one of said edges.

Preferably the structural component comprises four elongate angle members disposed about said longitudinal axis. Each respective elongate edge of said structural component being a corner edge of a respective angle member.

Preferably each end face of the structural component has a plurality of openings therein.

In a fourth aspect the present invention consists in a structural component adapted for use in the construction of temporary structures, said component comprising four elongate angle members disposed about a longitudinal axis and connected to each other by a bracing means and two spaced apart end plates disposed at opposite ends of said elongate members at right angles to said

longitudinal axis, each angle member comprising two legs at right angles to each other which intersect at an outer corner which defines an elongate edge of said member, each leg of each angle member having at least one row of spaced apart apertures, the row of apertures in each leg of the four angle members substantially aligned with each other, and wherein the two spaced apart end plates each have a plurality of openings therein which substantially align with each other.

Brief Description of Figures

Figure 1 is a perspective view of a first embodiment of the structural component of the present invention.

Figure 2 is an exploded perspective view of the structural member shown in Figure 1.

Figure 3 is a perspective view of a second embodiment of the structural member of the present invention.

Figure 4 is a perspective view of a third embodiment of the structural member of the present invention.

Figure 5 is a perspective view of a fourth embodiment of the structural member of the present invention.

Figure 6 is an elevation view of structural members of the type shown in Figure 1, disposed in a vertical and horizontal connected relationship.

Figure 7 is an enlarged elevation view of the upper end detail of two structural members shown in Figure 6 disposed in a vertical and horizontal connected relationship.

Mode of Carrying Out Invention

Figures 1 and 2 show an elongate structural component 1 consisting of two substantially square end plates 2 and 3 with four angle members 4 connected thereto, The legs 5,6 of each angle member 4 has a row of apertures (holes) 8 therein. Each end plate 2 and 3 has a plurality of spaced apart openings (holes) 13.

The structural component 1 has four faces 7 disposed about a longitudinal axis. Each face 7 is made up of two substantially co-planar legs 5,6 of adjacent angle members 4. The rows of apertures 8 in each angle member 4 are aligned

with each other, as well as the rows of apertures in the other three angle members.

In order to strengthen the structural component 1, a number of centre plates (bracing means) 9, substantially parallel to the end plates 2,3 are preferably welded to the angle members 4. In this embodiment the end plates 2 and 3 are preferably thicker than the centre plates 9, all of which are at right angles to longitudinal axis Y.

In a second embodiment of the present invention, a similar structural component 1 comprising end plates 2 and 3 and four elongate angle members 4 is shown in Figure 3. However, in this embodiment the centre plates 9 of the earlier embodiment are replaced by a series of "z-section" brace members 12, welded inside the four elongate angle sections 4. The main body of each brace member 12 being oriented obliquely to the end plates 2 and 3, and the longitudinal axis Y.

In a third embodiment of the present invention as shown in Figure 4, a structural component 1 similar to that of the first embodiment comprises end plates 2 and 3 and four elongate angle members 4. However, in this embodiment the centre plates 9 of the first embodiment are surrounded by orthogonal bracing plates (or straps) 14, to provide further strengthening of the structural component 1.

In a fourth embodiment of the present invention as shown in Figure 5, a structural component 1 similar to that of the third embodiment comprises end plates 2 and 3, four elongate angle members 4 and centre plates 9. However, in this embodiment the spaced apart orthogonal bracing plates 14 which provide further strengthening of the structural component 1, are disposed at locations between the centre plates 9 and the end plates 2 and 3.

Preferably the structural member 1 of all four embodiments is constructed from "off the shelf" structural steel products that do not have to be roll formed. Preferably the only processes necessary to manufacture the structural components 1 are, drilling punching and welding.

Preferably the structural component 1 of all four embodiments may be made in a number of standard lengths, say one metre, two metres, four metres and possibly six metres. These components 1 can be layed end to end to make a longer composite component by fastening together the end plate 2 or 3 of one

such structural component 1 to that of another by nuts and bolts (not shown) through openings 13.

As shown in Figure 6 a structural component of the first embodiment can in a vertical configuration be bolted (nuts and bolts omitted for purposes of clarity) to similar structural components disposed horizontally. The vertical structural component is shown as 1(v), whilst the horizontal structural components are shown as 1(h). The openings 13 of end plates 2 and 3 of vertical structural component 1(v) are aligned with apertures 8 on a face 7 of each horizontal structural component 1(h). Figure 7 depicts an enlargement of one such horizontal structural component 1h adjacent to a vertical structural component 1(v). It should be understood that the arrangement shown in Figures 6 and 7 is also possible with the second to fourth embodiments of the structural component.

All four embodiments of the structural component can be used in any configuration of verticals (uprights) and horizontal members. They can also be placed at 90° to each other, back to back, side to side, end to end, end to side or in any configuration suitable by aligning any four apertures 8, two from each of two rows on a face 7 of one structural component, with four other similarly spaced four holes on another component. It is preferable that in each structural component the apertures 8 of each row are spaced at a standard predetermined distance d, preferably about 100mm apart. Also the spacing between the apertures of adjoining rows of each face 7 should be spaced at a distance "nd". The same spacing "nd" should also be used on the openings 13 of the end plates 2 and 3. The number "n" being a whole number. In the figure 7, the spacing between the apertures of the adjoining rows is 2d, where n=2. This allows the structural component 1 to be modular in manner where it can be connected with any other similar component, where at least four apertures 8 on the one component align with four other apertures 8 of another component , or the apertures 8 of one component are able to align with openings 13 on the end plate of the other component. The distance between each aperture 8 and an edge of its respective face 7 in a direction orthogonal to the longitudinal axis Y, is "m d/2" where "m" is a whole number. In Figure 7 n=2 and m=1, however "n" and "m", may in another embodiment each be any whole number.

The structural component of the present invention can be utilised to build various scaffolding structures or other such temporary structures such as the demountable service tower described in Australian provisional patent application PQ0300 filed on 10 May 1999 and entitled "Service Tower" in the name of the present applicant.

DATED: 9 June 1999

CARTER SMITH & BEADLE

Patent Attorneys for the Applicant:

JOHN CLEMENT PRESTON

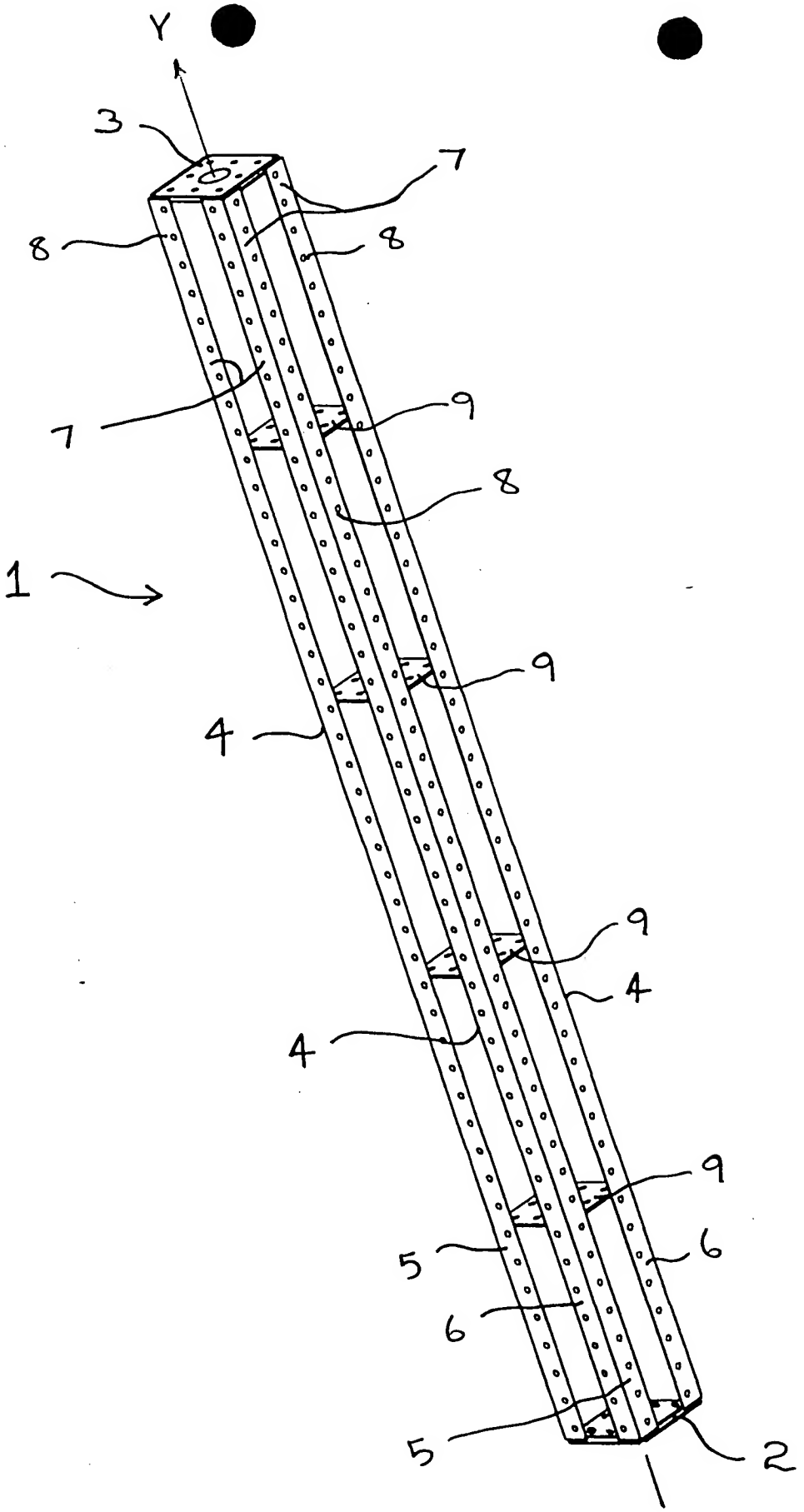

FIG. 1

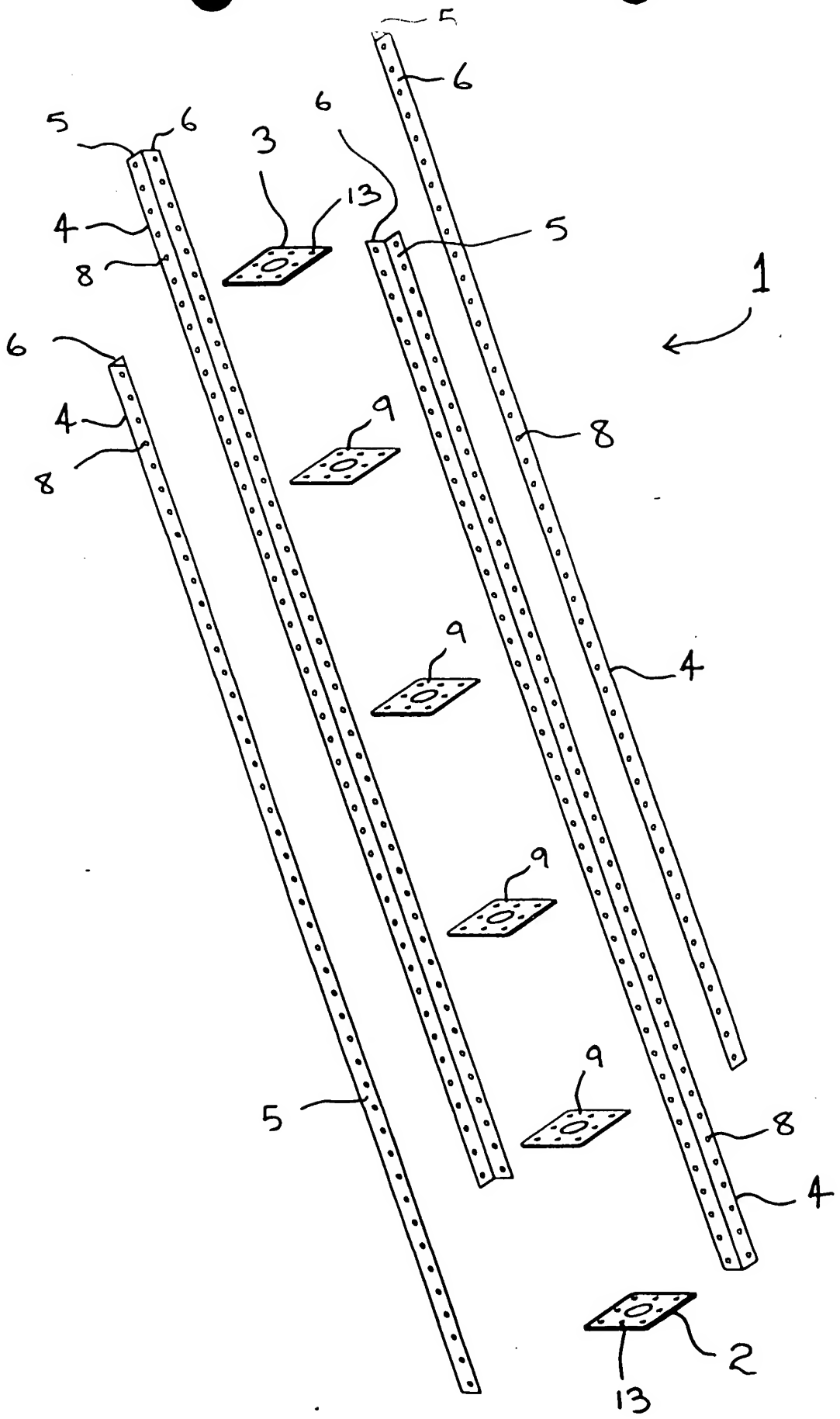

Fig. 2

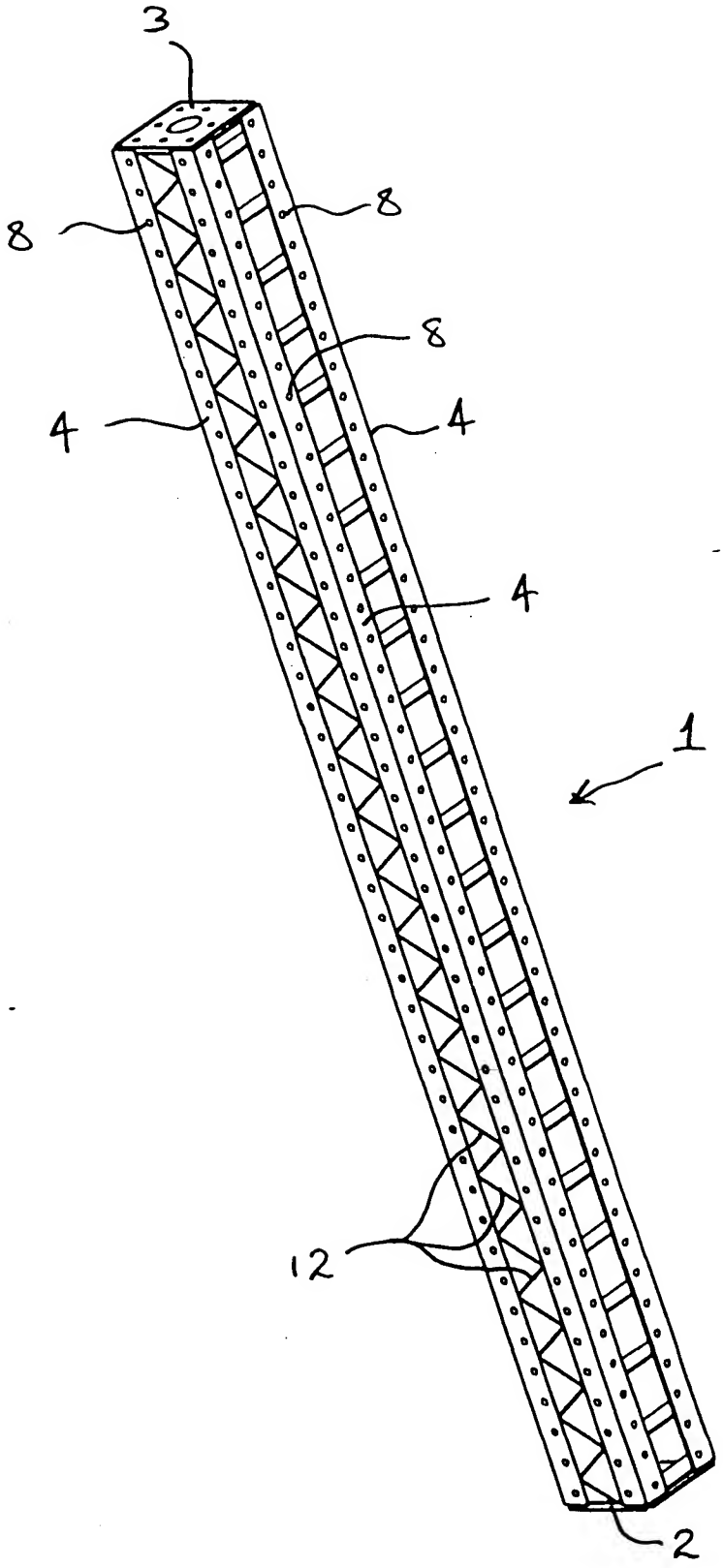

FIG. 3

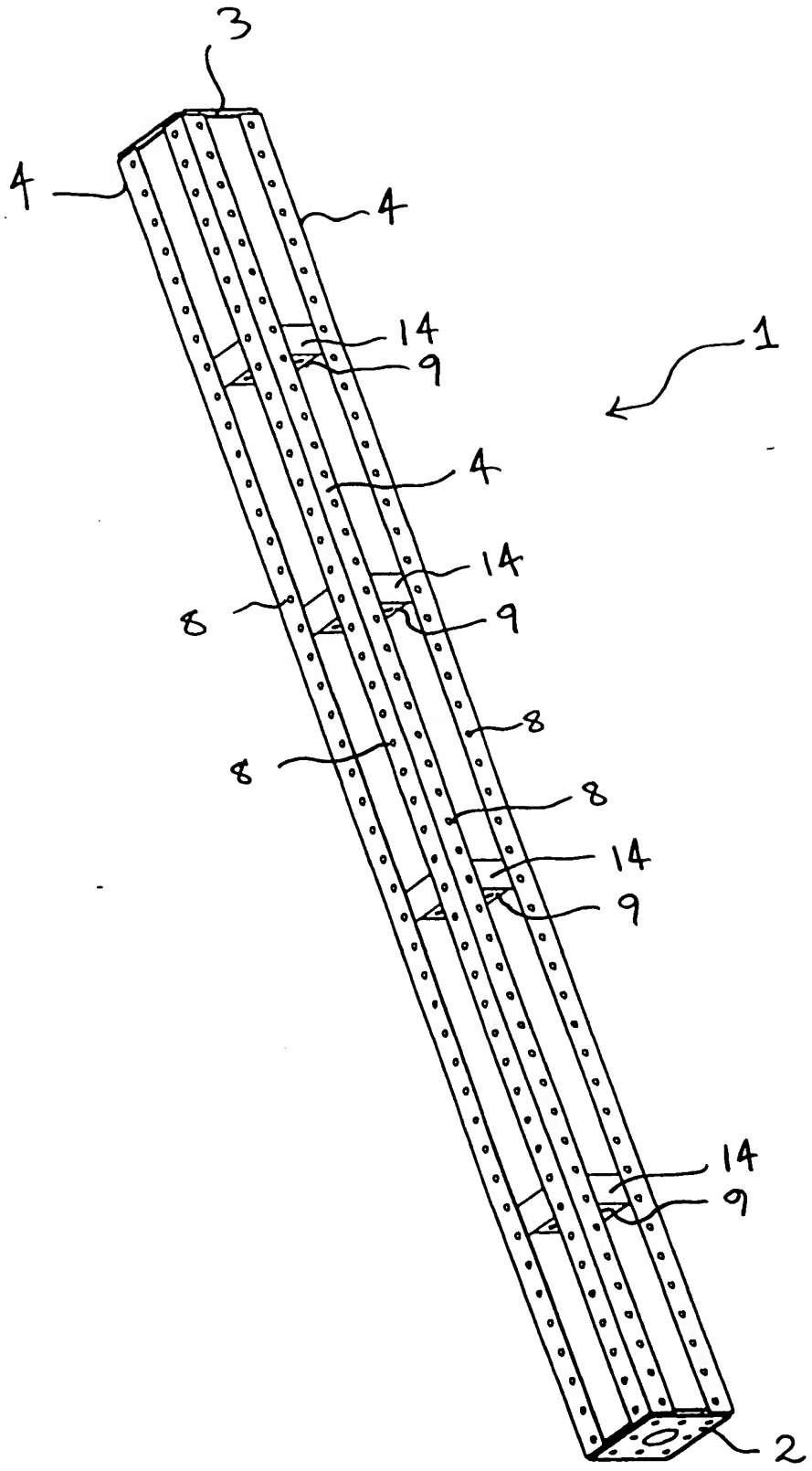

FIG. 4

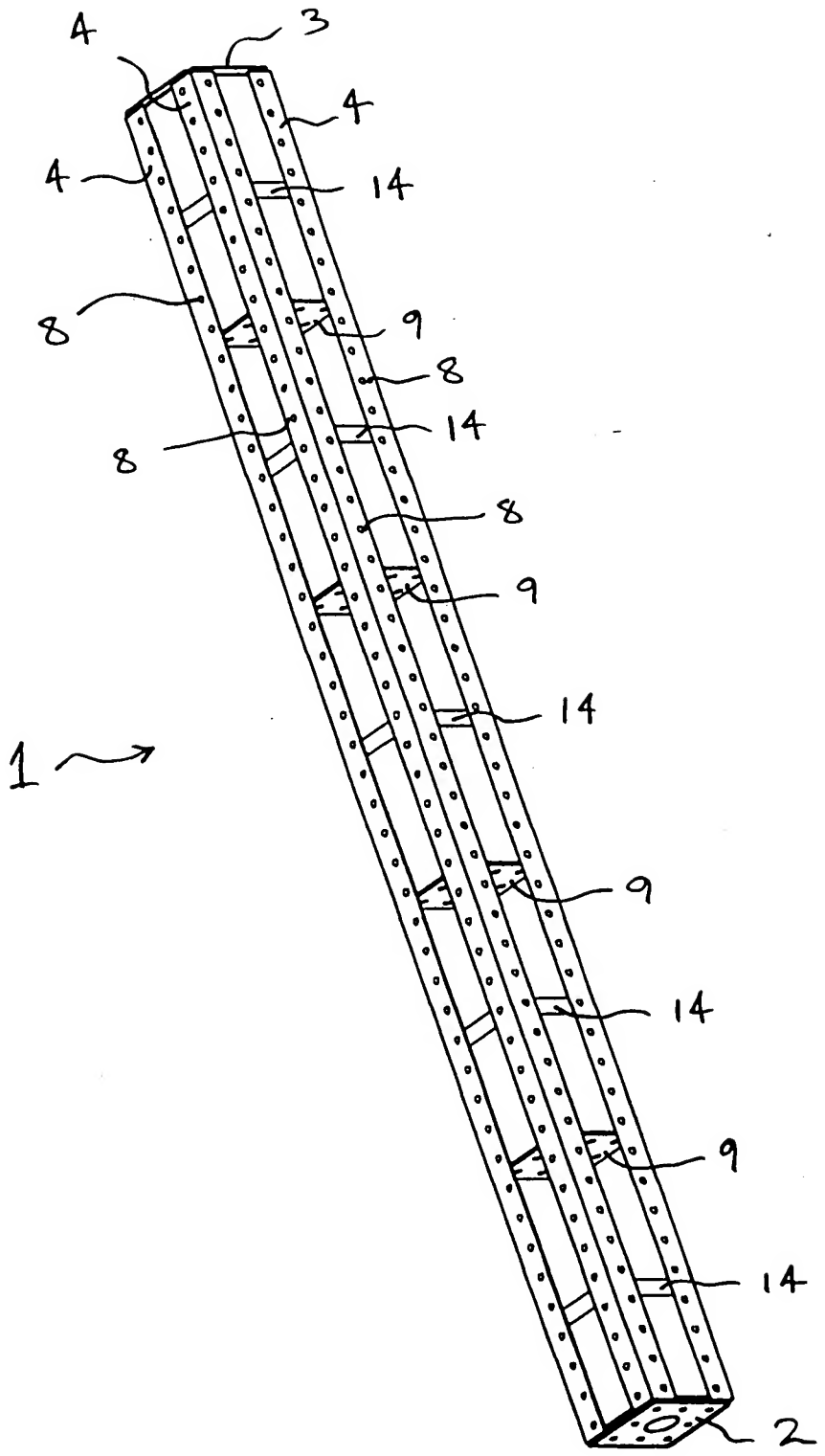

FIG. 5

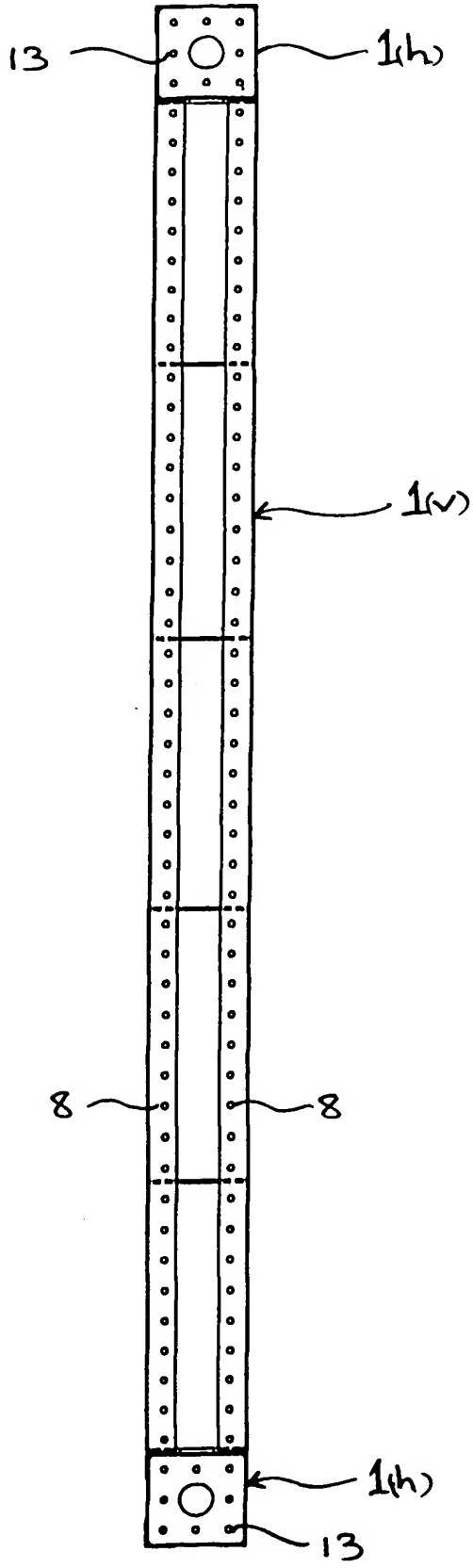

FIG. 6

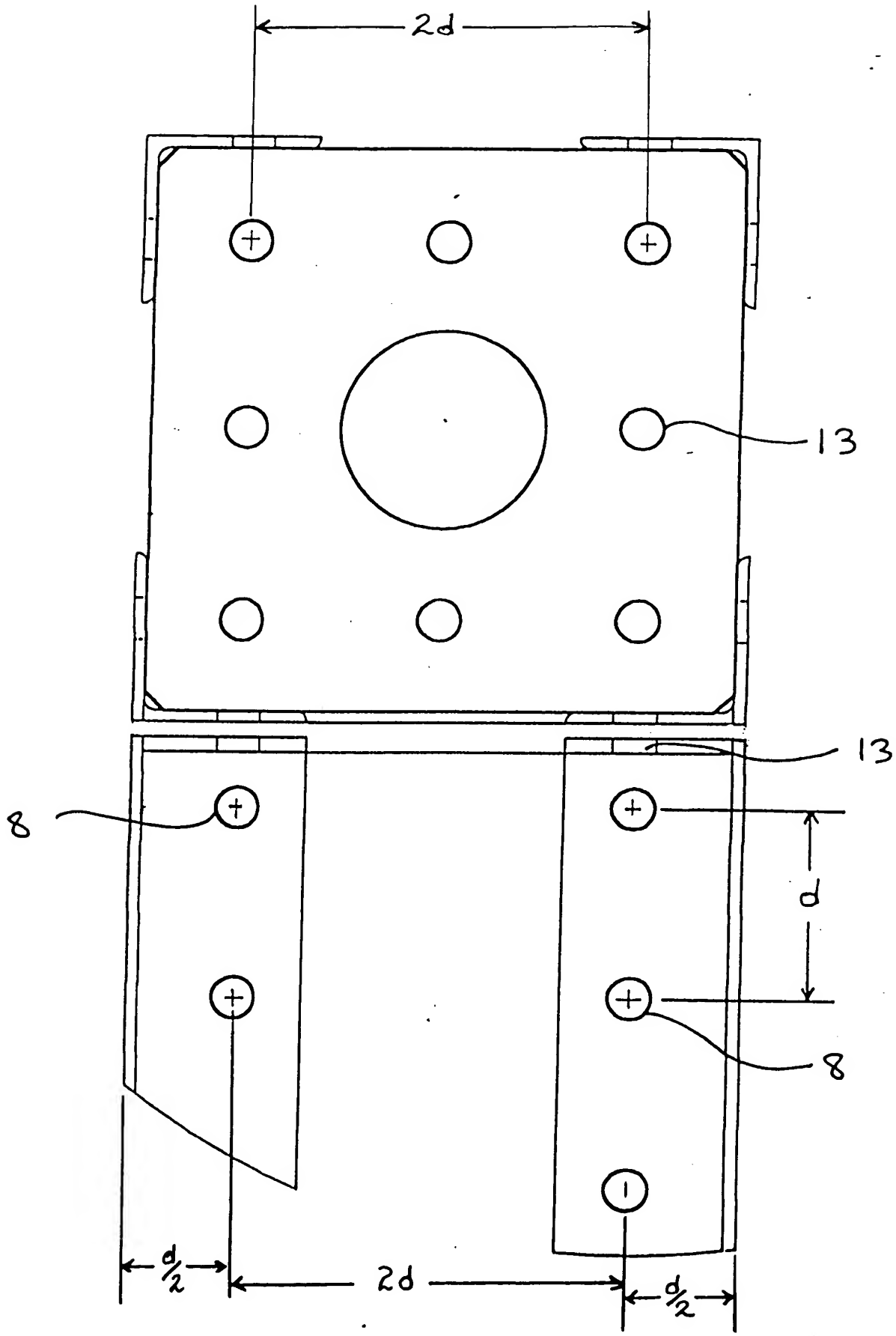

Fig. 7